sddec22-10: Low Water Crossing Level Indicator
Week 4 Report
February 21 - February 27

Team Members

Dylan Blattner — *Product Owner/Sensor lead*
Tyler Rebischke — *Team Leader/Solar Lead*
Jacob Ross — *Power Storage Lead*
Brandon Choy — *Wireless communications Lead*
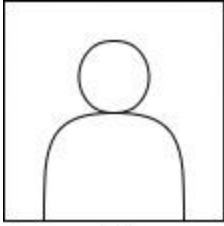Nithin Sebastian — *Signaling/Alerting*

Summary of Progress this Report

Our team continued to research the key components of our project. Dylan continued looking into water level sensors and different ways of processing the information. Tyler continued researching Solar technology and assisted Brandon with RF research. Jake continued researching power storage and also looked into RF communications. Brandon started looking at potential products for our RF communication module. Nithin began looking at programming strategies for addressable LED products.

Pending Issues

None

Use Case Diagram:

Persona Profile:
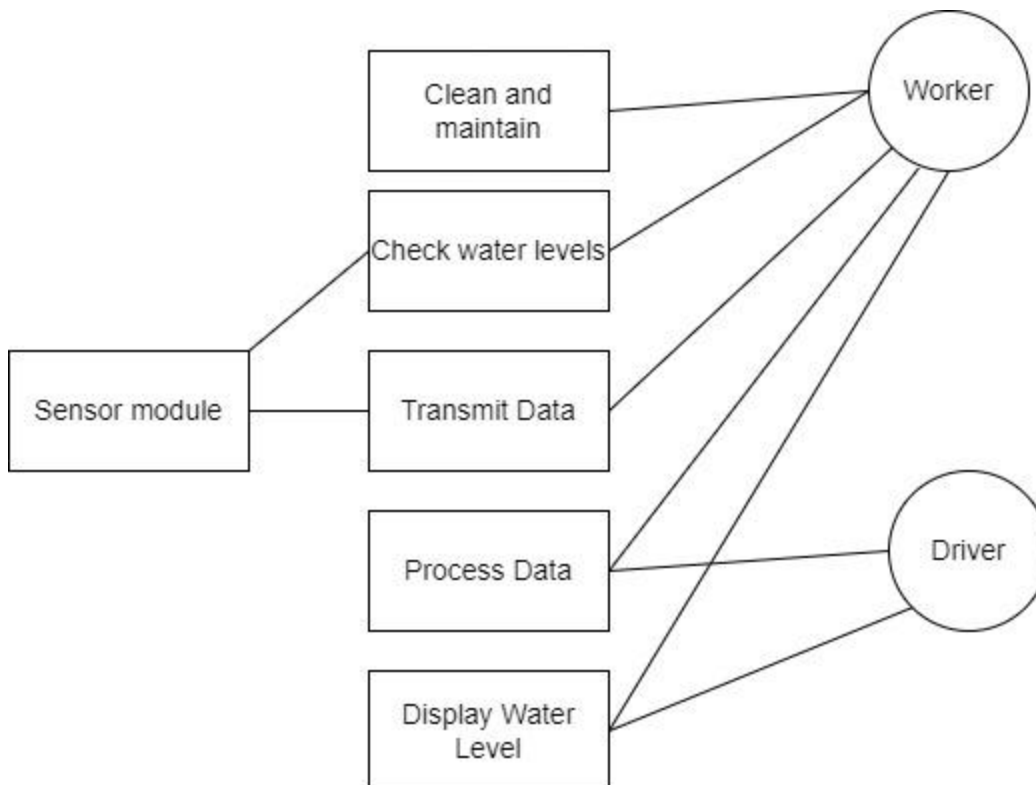
CHALLENGES AND FRUSTRATIONS
-Car might get swept away
-Don't know stream levels
-Don't want to waste time

Joe
Profession: Farmer
Age: 42
From: Boone, IA

Goals:
-cross the stream
-Get home safely on time

Influences:
-Weather
-Stream levels
-Family
-Friends

Plans for Upcoming Reporting Period

Dylan: Narrow down water sensors to top 3-5 products
Nithin: Narrow down addressable LED technology to top 3-5 products
Jake: Help Dylan narrow down water sensors to top 3-5 products
Brandon: Figure out top 3 RF technologies for our project.
Tyler: Help Brandon figure out the top 3 RF technologies for our project.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Dylan Blattner	Compared prices of different sensors and features Looked into Arduino product for our processor Started looking into weather resistance shells for our device	2	12
Tyler Rebischke	Did further research on solar panel configuration to find optimal deployment angle. Also, I consulted with NOAA flood charts so that we can get peak power output at the time of year most likely to experience flooding, which is April to July. After using different equations and online tools, to optimize power output during this time our panel should be angled at 40-48 degrees. Additionally, I helped with researching various RF technologies. I learned that a combination of more power and a lower data rate increases the distance you are able to transmit via RF frequencies. Also, if you have a longer wavelength you can penetrate more obstacles, but require a much larger antenna. Conversely, if you have a shorter wavelength, your signal cannot easily penetrate obstacles, but need a much smaller antenna.	6	21

Jacob Ross	More in depth research into RF communications Additional research into battery storage from a solar panel to a battery Continued observation of previously built device that mimics ours	3	13
Brandon Choy	Researched LoRa modules which is a form of rf communication that is able to do bidirectional communication with up to a 10 mile range if nothing is in the sight. Or 2-3 miles with obstacles in the way. Another plus of module is that it has a low power consumption Researched XBee modules which is another form of rf communication that is able to communicate and control devices at a larger distance up at minimum 28miles which uses more power. Looked into parts that are small and will work with an arduino	3	12
Nithin Sebastian	This week I continued to delve into researching how to program the LED strip lights, and continued finding resources on how to achieve our goal of programming the strip to represent water levels accurately.	2	10

Gitlab Activity Summary

Nothing to report.